DOCUMENT RESUME

ED 232 116 CG 016 810

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TITLE Smoking Onset among Teens: An Empirical Analysis of Initial Situations.
SPONS AGENCY National Inst. of Child Health and Human Development (NIH), Bethesda, Md.
PUB DATE Aug 82
GRANT BRSG-S07-RR-07080; NICHD-HD-13403-03
NOTE 30p.; Paper presented at the Annual Convention of the American Psychological Association (90th, Washington, DC, August 23-27, 1982). Based on Master's Thesis, University of Oregon.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Adolescents; *Habit Formation; Health Education; Health Programs; *Peer Influence; *Peer Relationship; Physical Health; Secondary Education; *Smoking; *Social Reinforcement; Tobacco

ABSTRACT

This study attempted to identify factors associated with smoking onset among teens. It was hypothesized that initial cigarette smoking is largely prompted by peers, and that these prompts and subsequent social reinforcement may account for smoking participation. An in-depth structured interview investigating the first three smoking or smoking pressure experiences was conducted with 157 teens, including persistent experimental smokers (who smoked more than 10 cigarettes), minimal experimental smokers (who smoked less than 10 cigarettes), and nonsmokers. Analyses confirmed that prompting by peers is characteristic of a large majority of smoking onset situations. Initial situations are much more likely to involve others of the same sex. In roughly half of the incidents another young person was trying a cigarette for the first time. Persistent experimenters, when compared with minimal experimenters, were exposed to significantly more influences to smoke. These influences included modeling and social encouragement. Additional data suggested that persistent experimenters were more primed to smoke than minimal experimenters. For example, they had engaged in more premeditation, accepted offers to smoke with less hesitation, and inhaled more frequently. Also, pleasant emotional and physiological effects discriminated continuers from quitters. Non-smokers appeared to possess more effective response strategies to refuse cigarettes. The results indicate that smoking prevention programs should give special emphasis to preparing young people to deal with situations in which direct offers of cigarettes are made by peers. (Author/AG)

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SMOKING ONSET AMONG TEENS:
AN EMPIRICAL ANALYSIS OF INITIAL SITUATIONS

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Running Head: Smoking Onset Among Teens

This report is based on a study conducted by the senior author in partial fulfillment of the Master's Degree requirements at the University of Oregon. The junior authors supervised the research. This investigation was supported in part by National Institute of Child Health and Development Grant No. HD 13403-03 at the Oregon Research Institute, and by BRSG Grant No. SO7RR07080 awarded by the Biomedical Research Support Grant Program, Division of Research Resources, National Institute of Health. The authors would like to thank Dennis Ary and Robyn Dawes for their advice, and Linda Nettekoven, Alan Silverblatt, Cheryl Phillips, Jane Welp, and Roxanne Kellogg for conducting the interviews in the study. Thanks also to Kate Ketcham and Agatha McLean for their typing and clerical assistance. Requests for reprints may be sent to Larry S. Friedman, Oregon Research Institute, 195 West 12th Ave., Eugene, Oregon 97401.

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ABSTRACT

This study attempted to identify factors associated with smoking onset among teens. It was hypothesized that initial cigarette smoking is largely prompted by peers, and that these prompts and subsequent social reinforcement may account for smoking participation. An in-depth structured interview investigating the first three smoking or smoking pressure experiences was conducted with 157 teens, including persistent experimental smokers (who smoked more than 10 cigarettes), minimal experimental smokers (who smoked less than ten cigarettes), and nonsmokers. Analyses confirmed that prompting by peers is characteristic of a large majority of smoking onset situations. Initial situations are much more likely to involve others of the same sex. In roughly half of the incidents another young person was trying a cigarette for the first time. Persistent experimenters, when compared with minimal experimenters, were exposed to significantly more influences to smoke. These influences included modeling and social encouragement. Additional data suggested that persistent experimenters were more primed to smoke than minimal experimenters. For example they had engaged in more premeditation, accepted offers to smoke with less hesitation, and inhaled more frequently. Also, pleasant emotional and physiological effects discriminated continuers from quitters. Non-smokers appeared to possess more effective response strategies to refuse cigarettes. Conclusions about the use of these data for prevention program design are discussed.

Social scientists are engaged in the development, implementation, and evaluation of prevention programs intended to reduce the rate at which young people initiate smoking activity (Arkin, Roemhild, Johnson, Luepker, & Murray, 1981; Botvin, Eng, & Williams, 1980; Evans, Rozelle, Maxwell, Raines, Dill, Guthrie, Henderson, & Hill, in press; Perry, Killen, Slinkard, & McAlister, 1980). These programs are typically schoolbased and aimed at students between the ages of 10 and 16. They have been formulated from a social learning conceptualization of smoking onset (Evans, Rozelle, Mittelmark, Hansen, Bane, & Havis, 1978). However, it seems reasonable to believe that prevention curricula and programs will be most effective if they are based on empirically established models of the onset process among adolescents. Hypotheses about the role of social influence factors in the initiation process must be buttressed by basic research aimed directly at the social environment and interactions of teens during the typically "at-risk" years. Surprisingly onset, the identified target of prevention efforts, is an underinvestigated process. There is a paucity of data regarding the specific influences that contribute to smoking onset (Pomerleau, 1980; Leventhal and Cleary, 1980).

Speculation about the role of social influence factors in smoking onset is based on substantial correlational evidence that teenagers are more likely to be smokers if their friends, siblings, and parents are smokers (cf., Biglan, Severson, McConnell, and Bavry, in press). However, the existing evidence only shows that the incidence of teenage smoking is related to the incidence of others' smoking. It does not indicate the characteristics of the situations in which young people actually begin to smoke. For example, although parental

smoking is correlated with adolescent smoking, it may be quite rare for a parent to be present when the youngster first smokes. More must be known about the precise situations young people will be facing, if we are to prepare them successfully to resist pressures to smoke.

An interview protocol was developed to explore the presence of psychosocial influence factors during smoking initiation. A teenage population was selected for study because for teens experimentation is a relatively recent event. Methodological problems with retrospective accounts are diminished when the investigation is conducted close to the time of initial usage (Gorsuch & Butler, 1976). One purpose of the study was to obtain a description of the first three situations in which each person had smoked a cigarette, or, if the person had never smoked, the first three times that they felt pressured to smoke. The interview was designed to discover the characteristics of these situations, including the time, place, and people present, and to determine whether overt social pressure occurred and the subject's reaction to the situation. The felt consequences of the person's abstaining or smoking were also probed. Finally, we inquired about the extent to which other substances such as alcohol and marijuana were used.

A second purpose of the study was to examine whether the characteristics of these pressure situations differed for three groups of adolescents: (1) those who had smoked more than ten cigarettes, (2) those who had smoked between one and ten cigarettes, and (3) those who had never smoked. Differences in the situations of those who did smoke and those who did not would point to possibly critical situational and motivational factors that prompt initial smoking.

Similarly, if the initial smoking situations of those who persisted in their experimentation differed from those adolescents who stop after ten or fewer cigarettes, it could be that the nature of those first experiences influences subsequent experimentation. Thus, these comparisons should delineate the situational characteristics which must be addressed in prevention programs.

There is some evidence suggesting that girls experience greater pressure to smoke than do boys (Silverstein, Feld, & Kozlowski, 1980), but that they have a lower tolerance to nicotine and, consequently, are more likely to feel sick when they first smoke (Silverstein, Kelly, Swan, & Kozlowski, 1982). For this reason the present study examined sex differences in the degree to which social pressures were experienced and the degree to which negative physiological reactions to cigarettes occurred among those who experimented.

METHOD

Subjects

One hundred fifty-seven adolescents in grades seven through twelve participated in this study. Forty-seven (30%) were from one middle school and 110 (70%) were from one high school. Both schools were selected because their student composition approximated national socioeconomic norms. However, the ethnicity of the sample was not representative since few nonwhite subjects participated. More high school students were recruited because it was difficult to identify smoking youngsters in the middle school. Ninety percent of the subjects who had smoked more than 10 cigarettes were from the high school portion of this sample.

Subjects included 74 males (47%) and 83 females (53%). Ages ranged from 12 years to 19 years with a mean of 15.2. There were no significant differences between the schools on demographic variables, including number of people living in the home, number of bedrooms in the home, mother's and father's educational level, or the subject's own educational aspirations. Consequently, data from the two schools were combined for statistical analysis.

Design

Subjects were recruited in roughly similar proportions for each of three comparison groups: (1) nonsmokers - those who had never puffed a cigarette (N = 50); (2) minimal experimenters - those who had experimented with cigarette smoking but who had not smoked more than 10 cigarettes in toto (N = 48); and (3) persistent experimenters - those who had progressed beyond 10 cigarettes (N = 59). The latter group included some subjects who had discontinued experimentation (42%) and some who were continuing to smoke. Preliminary analyses indicated that there were few differences in the details of their initiation situations between those persistent experimenters who were still smoking and those who were not.

These three groups did not differ significantly on most demographic variables, including sex, number of people living in the home, number of bedrooms in the home, or mother's and father's educational level (cf., Borland & Rudolph, 1975). They did differ significantly (p .05) on age and educational aspirations, with persistent experimenters being somewhat older and having lower educational plans. There were no sex differences on these variables within each group.

Measures

The primary measure employed was a structured, open-ended interview which was designed to elicit detailed information about the first three situations in which the subject smoked a cigarette. Each of the first three smoking incidents was successively probed in depth. An interview methodology was selected as the best approach to accomplish this detailed exploration of the circumstances surrounding smoking onset. Item selection for the protocol was guided by social learning theory (Bandura, 1977), empirical data regarding social and peer influences in teenage smoking (Biglan et al., in press; Biglan, McConnell, Severson, Bavry, & Ary, Note 1) and studies of situational determinants of smoking relapse (Shiffman, 1982; Lichtenstein, Antonuccio, & Rainwater, Note 2). Subjects were asked to describe fully the circumstances surrounding their initial smoking experimentation. The interviews systematically probed for salient variables, such as number and sexes of people present, and social antecedents and consequences. Subjects' descriptions of social, emotional and physiological responses were recorded verbatim.

For nonsmokers, those who had never puffed a cigarette, a modified version of the protocol was employed. These students were asked to report on the first three situations in which they considered smoking, felt a desire to smoke, or felt pressured to smoke. Similarly, minimal experimental smokers who could report only one or two smoking occurrences were asked to complete the trilogy with immediately subsequent pressure situations. Thirteen percent of the situations reported by minimal experimenters were ones in which they did not smoke.

Two physiological measures of smoking activity, expired air carbon monoxide (Lando, 1975; Horan, Hackett, & Linberg, 1978) and saliva thiocyanate (Horning, Horning, Carroll, Stillwell, & Dzidic, 1973; Prue, Martin, & Hume, 1980) were obtained to corroborate reports of smoking and to increase the accuracy of self-reports about smoking activity (Evans, Hansen, and Mittelmark, 1977).

Procedures

Two methods were employed to recruit students for this study. At the middle school a letter was sent to the parents of all enrolled children. Concurrently, daily announcements were made on the school's public address system and posters describing the project were displayed in central locations. Students were instructed to approach project staff in the library at designated times if they wished to participate.

At the high school, verbal announcements were made by project personnel in classes that were identified by the principal. Coeducational classes with students from each grade were randomly selected. Materials describing the project were mailed to parents of those students who expressed interest. In addition, it was necessary to approach high school smokers directly to obtain an adequate sample. This was accomplished in the designated school smoking area during morning break. Subjects at both schools were paid $10.00 for full participation in this study.

When subjects arrived for the interview they were asked to provide expired air and saliva samples and to fill out a questionnaire concerning smoking, other substance use, and demographics. The

interviews were done in one session. The typical length of the interview was approximately 60 minutes.

Seven interviewers, graduate students and advanced undergraduates in the behavioral sciences, conducted the interviews. Training included didactic sessions and experiential exercises such as role-plays and pilot interviews prior to data collection. An item-by-item method of calculating reliability was used in which number of agreements was divided by number of agreements plus disagreements. The interviewers were evaluated for verbatim recording of subject responses and they attained a mean score of 95.4% (range: 93.5% - 96.7%) against criterion protocols. During the study, all interviews with subjects were audio-tape recorded to assess inter-rater reliability. A subset (21%) of these tapes were re-coded. Inter-rater reliabilities ranged from 85.7% to 100%, with a mean of 94.7%.

The coding of open-ended interview responses required content analyses. Items from the protocols of 47 subjects (30% of the sample) were used to develop empirical response categories. Subsequently, interview responses were independently coded two times and disagreements were identified. Each disagreement was conferenced by the two original raters, plus the first author, until a consensual decision was reached.

RESULTS

Analyses

The data were submitted to two modes of analysis. One was descriptive, in which normative statements were derived about influences associated with initial smoking episodes and pressure

situations. Unless otherwise indicated, descriptive data are reported as percentages of the total number of incidents. The second mode of analysis contrasted the responses of the comparison groups. First, nonsmokers were contrasted with experimenters. Subsequently, the minimal experimenters were compared with persistent experimenters.

Descriptive Data

Table 1 presents descriptive information about the initial situations in which young people actually smoked or felt pressured to smoke. The proportion of incidents in which subjects responded in a particular way is presented for each variable. Because some questions such as "How were you pressured to smoke?" were only asked of a subset of subjects, the number of subjects contributing to these variables ranged from 27 to 143 for each incident. Some of the minimal experimenters and nonsmokers did not have second and third incidents to report and fourteen of the nonsmokers said they had never felt tempted or pressured to smoke at all. The number of subjects contributing to incidents two and three were therefore less than the number contributing to incident one. Where data are combined for all incidents, the denominator for these proportions is the total number of incidents.

Insert Table 1 about here

Time, place, and source of cigarettes. Initial smoking or pressure incidents seemed to occur with equal prevalence during the week (53%) and on weekends (47%). (Fridays were included as part of the weekend.) Afternoons were the most likely time (61%). Home was the place most often reported for these incidents (33%), but outdoor

neighborhood locations (19%), friends' homes (18%), and at school (14%) were also common places. In 41% of the first three incidents in which a cigarette was smoked, the cigarette had been purchased by someone in the group. In 30% of the instances it had been taken without permission.

Social factors. It is clear that smoking initiation is not a solitary event. Across the first three incidents, 89% of the subjects confirmed that others were present when they experimented or felt pressured. Talking was the normative activity reported (39% of instances), and playing outdoors was a distant second (10%).

The role of peers is also vividly established by data about those who were present with the subject. Friends (57%), acquaintances (20%), and siblings (11%) accounted for 88% of all those present when experimentation occurred. Parents and other relatives were 8% of those present, although they were involved more often the first time (15%) than on subsequent occasions (4% for incident two and 5% for the third incident). Overall, a mean of 2.2 others were present during the first three smoking/pressure incidents. On average, 1.4 of these were identified as smokers. In many incidents others were engaged in initial smoking experimentation; a mean of .48 heretofore nonsmokers experimented with the subject. To put it a different way, for one-half of the subjects another novice was also experimenting during at least one of their first three smoking/pressure incidents.

Boys experimented with boys, and girls with girls. When others were present, there were significantly more boys at the boys' incidents than at the girls' incidents, $t(74.4) = 4.53$, p .001, while

there were more girls at the girls' first incidents than at the boys' incidents, $t(104.4) = -8.00$, $p < .001$.

Most subjects did not endorse the item asking if social pressure was involved in the initial three situations. As shown in Table 1, only 30% of the incidents were perceived as involving social pressure. For those instances where pressure was felt to have occurred, three types of pressure were cited with some frequency: modeling by others (25%), teasing by others (25%), and the person's own appraisal of the situation (e.g., "I need to do this to be accepted by my friends") (25%). Despite the fact that most instances were not labeled as involving social pressure, many facets of the interactions do suggest the existence of social influence factors. Seventy-six percent of the times in which someone else was present, one or more people suggested to the subject that he or she smoke. In 63% of the incidents someone else offered a cigarette and 76% of the subjects received an offer in at least one incident. In 36% of the incidents the subject was verbally encouraged to smoke or was teased for refusing or hesitating to smoke.

Experimenting subjects (minimal and persistent combined) could remember specific social consequences for their smoking in only 58% of the instances. In 23% of the situations, subjects' smoking received verbal approval; in 12% of the incidents, subjects' behavior was disapproved by others. Among those who abstained, social consequences for their refusal were recalled for 48% of the instances. In 21% of the incidents, refusal was met by verbal or nonverbal aversive reactions. Four percent of the time others continued to encourage the

subject to smoke. Ten percent of the time abstainers received verbal approval for their refusal.

Indicators of distal influences. The evidence suggested that some subjects were prepared to smoke prior to the initiation situations. Subjects were planning to smoke in 22% of these incidents. Also, in 38% of the instances subjects indicated that they took a cigarette without hesitation.

Inhalation. Experimenters reported at least some inhalation in 62% of their smoking incidents. However, when inhalation occurred, in only 39% of the instances did the subject report inhaling on each puff. Similarly, in 40% of the incidents inhalation was characterized as "light".

Refusal responses. Three reasons were frequently cited by nonsmokers for refusing cigarettes: fear of disapproval (13%); fear of the effects of smoking on health, attractiveness, or athletic performance (20%); and the subjects personal convictions (37%). The latter category involved both religious beliefs and a lack of identification with "the type that smokes." Two chief methods of refusing were reported: simple/direct refusals, such as "No thanks, I don't want one" (41%), and avoidance, such as leaving the situation (38%). Although both strategies were co-equally reported, avoidance was in one sense under-represented since, as noted above, fourteen of 50 nonsmokers in the sample could not recall even one incident when they felt pressured to smoke.

Association with alcohol and marijuana use. There does not seem to be a strong association between initial smoking and alcohol or marijuana use. Nine percent of the incidents also involved alcohol

consumption and nine percent involved marijuana use. However, among subjects who had three smoking or pressure incidents there were significant trends for smoking to become more closely associated with both alcohol, $Q(2) = 17.8$, $p = .032$ and marijuana, $Q(2) = 17.8$, $p = .001$ across the first three incidents.

Physiological and emotional reactions. Subjects described both pleasant and unpleasant physiological and emotional reactions. Physiologically pleasant effects included descriptions such as "felt high" (11%), and "felt relaxed" (3%). Descriptions of pleasant emotional reactions included "cool" (4%), "good" (15%), "part of the crowd" (5%), and "older" (11%). Physiologically unpleasant reactions were dizziness (38%), coughing (35%), and sickness (20%). Descriptions of unpleasant feelings included fear (8%), guilt (11%), and feeling "bad" (2%). These percentages indicate the proportion of incidents in which the particular reaction was reported.

The number of pleasant physiological reactions was consistently low ($M = .17, .12, .14$) across the three occasions. In contrast, the number of unpleasant physiological reactions reported was initially high but significantly decreased over the three incidents ($M = 1.1, .79, .53$), $F(2,168) = 10.84$, $p = .0001$. The number of unpleasant emotional reactions declined significantly over the three incidents, $F(2,220) = 8.84$, $p = .0002$ ($M = .46, .27, .17$). There was no significant change in the number of positive emotional experiences. (Data on emotional reactions include nonsmokers. Data on physiological reactions do not.)

There were no significant differences between males and females on number of unpleasant physiological reactions during initial smoking

experiences. These results failed to replicate the findings reported by Silverstein et al. (1982). However, an analysis of unpleasant emotional reactions approached significance, $t(140) = 1.90$, $p = .06$, with girls describing more negative emotional effects.

Comparison of Minimal and Persistent Experimenters

The characteristics of the first three smoking/pressure incidents were compared for minimal experimenters and persistent experimenters. Chi square tests were applied to nominal level data, and for continuous variables 2 x 2 (sex by type of experimenter) ANOVA's were used. However, analyses of sex differences revealed few significant results. Consequently data were collapsed across sexes and uncorrelated t-tests were used to compare the two types of experimenters.

Social influences. Persistent experimenters had more people present at their first three incidents than did minimal experimenters, $t(94) = -2.14$, $p = .035$. The number of people present who smoked was also higher for persistent experimenters than for minimal experimenters, $t(94) - 2.63$, $p = .01$. Minimal experimenters and persistent experimenters did not differ in their perception of whether they had been pressured. However, many subjects did report responses on the part of others in the situation that could be best construed as social pressures. For the second incident, the minimal experimenters reported receiving significantly more of these pressures to smoke than did persistent experimenters, $\chi^2(1) = 3.9$, $p = .047$. The types of prompts included verbal encouragement to smoke, teasing, and exclusion for hesitation. The groups did not differ on the first and third incidents.

Indicators of distal influences. For incidents two and three, the persistent experimenters were more likely to say that they had planned to smoke that day (incident 2: $\underline{X}^2(1) = 13.7$, $\underline{p} = .0002$; incident 3: $\underline{X}^2(1) = 4.5$, $\underline{p} = .03$). They also reported that they had accepted offered cigarettes with significantly less hesitation in two of the first three situations (incident 1: $\underline{X}^2(1) = 4.5$, $\underline{p} = .03$; incident 2: $\underline{X}^2(2) = 5.7$, $\underline{p} = .06$; incident 3: $\underline{X}^2(2) = 10.4$, $\underline{p} = .006$).

Response to the situation. Minimal experimenters were more likely in the first incident to verbally disapprove smoking than were persistent experimenters, $\underline{X}^2(2) = 7.6$, $\underline{p} = .022$.

Felt consequences of smoking. Persistent experimenters felt significantly more pleasant physiological reactions to their first three smoking experiences than did minimal experimenters, $\underline{t}(98) = -2.25$, $\underline{p} = .027$. They also reported more pleasant emotional effects, $\underline{t}(103) = -3.26$, $\underline{p} = .002$. However experimenters who persisted did not report significantly fewer urpleasant physiological or emotional reactions to these cigarettes. Persistent experimenters were significantly more likely to report being satisfied with their first smoking incident than were minimal experimenters, $\underline{X}^2(2) = 9.7$, $\underline{p} = .008$. There were no differences for the second and third incidents.

Comparisons of Experimenters and Nonsmokers

Many nonsmokers simply did not experience situations in which they felt they should smoke. Fourteen of the 50 nonsmoking subjects could not recall a single pressure incident. Moreover, only 28% of nonsmokers could recall three instances in which they felt pressure to smoke. In the analyses reported in this section, the incidents for

experimenters were compared with those that were experienced by nonsmokers.

Social influences. There were significantly more novices (other than the subject) smoking in the situations reported by experimenters than in the situations reported by nonsmokers, $t(58) = -4.75$, p .001. Experimenters reported that others present reacted positively to their smoking significantly more often than nonsmokers received positive reactions to their abstinence, (incident 1: $X^2(2) = 14.8$, $p = .0006$; incident 2: $X^2(2) = 8.3$, $p = .016$; incident 3: $X^2(2) = 14.7$, $p = .0006$).

Indicators of distal influences. In all three incidents, experimenters were more likely to have planned in advance to smoke, (incident 1: $X^2(1) = 3.8$, $p = .051$; incident 2: $X^2(1) = 7.6$, $p = .0057$; incident 3: $X^2(1) = 4.5$, $p = .03$). Similarly they were much more likely to take offered cigarettes without hesitation (incident 1: $X^2(2) = 67.9$, p .0001; incident 2: $X^2(2) = 40.1$, p .0001; incident 3: $X^2(2) = 14.3$, $p = .0008$). Experimenters were more likely to have brought cigarettes to the situation or to have asked others for theirs ($X^2(2) = 6.3$, $p = .044$; $X^2(2) = 7.6$, $p = .022$; $X^2(2) = 5.8$, $p = .055$).

Felt consequences. Despite the fact that they reported fewer positive reactions from others in the situation than did the experimenters, nonsmokers evaluated their first pressure incident more positively than did experimenters, $X^2(2) = 7.5$, $p = .024$. There were no differences for the second and third incidents.

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DISCUSSION

Characteristics of Initial Situations

The results demonstrate that in the vast majority of cases the final common pathway to initial smoking is a social situation in which peers or siblings are smoking. Fully 78% of the first three smoking incidents or pressure situations were ones in which a peer or sibling was smoking. The situations were significantly more likely to involve others of the same sex. In roughly half of the initial instances another young person was smoking for the first time. Cigarettes were directly offered to the subject in 63% of the instances. These results are consistent with evidence from questionnaire studies which show that peer smoking status is correlated with subject smoking status (cf., Levitt & Edwards, 1970). Moreover, the correlation does reflect the tendency of other young people to actually prompt initial smoking. The correlation of parental smoking status with adolescent smoking status (Krosnick & Judd, 1982) appears to reflect a different type of effect since parents are seldom present at initial smoking experiences.

Despite the failure of subjects to label social pressures, they appear to be an important facet of the onset situations with which young people must cope. In the majority of instances (70%), young people did not perceive that they were being pressured to smoke. However, in many cases there were events that might fairly be labeled social pressures. Others suggested to the subject that he or she smoke in 76% of the incidents in which someone else was present and, as noted above, in 63% of these situations a direct offer of a cigarette was made. In a minority of instances (36%), teens were

teased for refusing or hesitating to smoke. Moreover, the novices often received verbal approval for smoking.

At the same time, experimentation is apparently not entirely a product of the onset situation. The evidence that subjects were planning to smoke in 22% of the instances and took a cigarette without hesitation in 38% suggests that distal influences also "prepared" some young people to experiment. As suggested above, parental smoking may be one such distal influence, since parents are seldom present at initial situations though their smoking status is related to their children's status.

These data indicate that initial smoking occurs primarily with same sexed teens. Such sex-linked smoking does not seem to continue once regular smoking has developed. For example, Kniskern, Biglan, Lichtenstein, Ary, & Bavry (in press) found that adolescent smokers are induced to smoke by both same and opposite sex models.

The results also clarify the relationship of cigarette smoking to alcohol and marijuana consumption. It is well established that the incidence of cigarette smoking is associated with the use of both these substances among teens (cf., Dull & Williams, 1981). The present study indicates that these substances are infrequently present (9% for each) at the time of smoking initiation, but that they are increasingly likely to be used across the first three incidents. Further research should determine whether cigarette smoking is a precursor to the use of alcohol and marijuana or whether the practice of relatively clandestine adolescent vices, which may be initially independent, quickly become associated.

The overwhelmingly social nature of initial smoking (89% of incidents) and the frequency of specific offers of cigarettes (63% of all incidents) have implications for models of smoking initiation that focus on attitudinal, personality, and intentional precursors of smoking (cf., Chassin, Presson, Bensenberg, Corty, Olshavsky, & Sherman, 1981; McAlister, Krosnick, & Milburn, Note 3). It would appear from the present results that attitudes and intentions that are favorable to smoking are unlikely to determine smoking in the absence of propitious social situations. It will be important in further studies to tease out the extent to which social interactions prompt, shape, and reinforce attitudes and intentions themselves and the extent to which attitudes and intentions are associated with young people seeking initial smoking situations.

Relationship Between Initial and Subsequent Smoking

The results of contrasts between subjects who went beyond the first ten cigarettes and those who stopped at ten or fewer suggest that there were aspects of the situation and the subject's reaction to the experience that may have influenced subsequent smoking. There were also differences in the extent to which the adolescents were prepared to smoke prior to the initiation incident. Persistent experimenters had initial smoking situations in which more people were present and more people smoked. They also reported having more frequent pleasant physiological and emotional experiences during the first three smoking incidents. At the same time, those who continued to experiment beyond ten cigarettes were more likely to have planned to smoke in incidents two and three and to have had their own cigarettes. The existence of positive physiological and emotional

reactions to the first three incidents among those who persisted in smoking after the first ten cigarettes suggests that the smoking experiences may have been more reinforcing for this group. However, it is not possible from these data to sort out whether the reactions reflected pharmacological effects of cigarettes, reactions to social reinforcement, or some combination of these.

It might have been predicted from the study by Silverstein, et al. (1982) that women who persisted in experimenting would differ from those who did not in the degree to which they had negative reactions to smoking. This was not the case, however. Moreover, there was no sex difference in the reported extent of negative physiological reactions to initial cigarettes. The only evidence that the present study provides to support the hypothesis that women are more adversely affected by cigarettes is the finding that they tend ($p < .06$) to report more unpleasant emotional reactions. These conclusions must be tempered, however, by the fact that they are drawn from retrospective accounts of reactions to initial smoking experimentation.

A general problem in interpreting these results should be noted. It is possible that the differences between those who persisted in smoking cigarettes and those who did not was due to differences in retrospective reporting rather than real differences in the situations. This is particularly plausible if minimal experimenters had experienced their first three incidents more recently and thus had not yet had the opportunity to go beyond ten cigarettes. This was checked by comparing the groups on how recently the incidents had occurred. There was no difference in recency of events.

Comparisons of Experimenters and Nonsmokers

Three types of factors are associated with the probability that a young person will experiment with cigarettes. First, there is social pressure to do so. Only 28% of those who never experimented could recall three instances in which they felt pressured to smoke. Similarly, those who smoked were more likely to be with other novices who were smoking for the first time. Second, there seems to be a greater likelihood that those who smoked were prepared to do so. They were more likely to have planned to smoke, they had their own cigarettes more frequently, and they were more likely to take the available cigarettes without hesitation. Third, there may be differences in the degree to which experimenters and nonexperimenters possess skills for avoiding and refusing offers of cigarettes and responding to more subtle prompts to smoke. Nonsmokers often indicated that they avoided situations where smoking might take place. At least for the first incident, nonsmokers were more likely to leave the situation than were those who smoked. The most frequent forms of refusal behavior that these young people reported were direct/simple responses (e.g., "No thank you.") and avoidance (e.g., "I have to go now.").

One caution should be noted. The nonsmokers were asked to report about the first three pressure situations, while those who smoked were asked to report on the first three smoking situations. It is likely that those who had smoked also encountered pressure situations in which they did not smoke prior to their experimentation. Thus incidents of the type reported by nonsmokers may in fact serve to prepare the person for later situations in which they do smoke.

Nevertheless the results do identify differences in the nature of situations in which young people do and do not begin smoking, differences in the preparedness of young people to smoke, and differences in their tendency to resist and avoid pressure.

Implications for Prevention Programs

These results imply that smoking prevention programs should give special emphasis to preparing young people to deal with situations in which direct offers of cigarettes are made by peers. This may be particularly critical when there are others trying cigarettes for the first time. It seems essential to teach young people ways to directly and effectively refuse cigarettes in the face of offers and to cope with the negative feedback and loss of approval that refusals may elicit. The target situations should be primarily ones involving same sex peers. Additionally, the programs must be systematic in their attempt to dissuade young people from anticipating or planning to experiment with cigarettes, since the probability of experimenting and the probability of persisting are both associated with the degree to which the young person planned to smoke in the beginning.

Limitations of the Study

There were specific limitations in the scope and design of this study. First, only two schools were sampled thus constraining generalizability. Second, the subjects in this study were self-selected, having responded to recruitment campaigns conducted by mail and in the classroom. It is impossible to ascertain how closely this group would compare with a random sample. Third, this study represents a cross-sectional approach. Non-smokers were included as a comparison group to contrast differences among groups of teens who did

and did not experimentally smoke. Finally, these data are based on retrospective accounts of smoking initiation experiences. It would be useful to employ alternative methodologies to replicate these results. Shiffman (1982), for example, has used a telephone hot-line to collect immediate accounts of smoking relapse situations. A similar procedure might be used with adolescents to study smoking pressures they encounter.

Conclusion and Recommendation

A longitudinal design is desirable for future research in this area. Adolescents who have experimented or become smokers might be interviewed first about pressure incidents (similar to non-smokers in the present investigation) as a prelude to actual onset. In this fashion, the acquisition process could be studied developmentally (Leventhal & Cleary, 1980). Differences in social influences present at times when smoking did and did not occur could be analyzed on an intrasubject basis. Moreover, these data suggest that the social influences proxial to initial smoking may be moderated or enhanced by distal experiences which "prepare" or prime the subject to participate or abstain. These distal influences must be identified and systematically studied in longitudinal research.

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